

ART. XXI.—*Annual Report of the Physician-in-Chief of the Marine Hospital at Quarantine.* Presented to the Legislature of New York, February 4, 1857. 8vo. pp. 64: Albany, 1857.

THE report of Dr. Harris, Physician of the Marine Hospital of New York, is chiefly interesting from the history it presents of the yellow fever as it prevailed during the summer of 1856, at different points along the shores of New York Bay.

The first case of the disease was admitted into the Marine Hospital, Staten Island, on the 18th of June, from on board of a vessel that had just arrived from St. Jago de Cuba, where yellow fever was beginning to prevail when she left. Between this date and the evening of the sixth of July, four other vessels, all having the fever on board, arrived from Havana, where the disease was epidemic at the period of their departure. During the month of July, a number of other vessels, with the disease on board, arrived from infected ports, and were detained at the quarantine station. It was in persons from on board of those vessels, or who were engaged in unloading their cargoes, or had visited them, or been in their immediate vicinity, that all the first cases of yellow fever in the vicinity of New York occurred.

Previous to the 15th of July, several of the infected vessels lying at quarantine had discharged cargo upon lighters under quarantine order. Up to that date twenty-seven yellow fever vessels had arrived; and of this number, ten or more were lying at anchor nearly opposite the Marine Hospital, or at Gravesend Bay. One had discharged a portion of her cargo, and, as subsequently appeared, fourteen bales of filthy rags from on board had been stored in an open shed on the U. S. Government dock at quarantine.

While lying at quarantine those vessels had destroyed, or cast into the bay, large quantities of refuse matter, decaying fruits, old bedding, etc., and all such matters as floated on the water were carried in directions and to localities which became, subsequently, the lurking places of pestilence.

"The total number of seamen admitted to Marine Hospital with yellow fever, immediately upon the arrival of the vessels from sickly ports, was seventy-two, and these were received from thirty-three vessels. The number of cases received, subsequently, from the same vessels was fourteen, from five of the vessels. Besides these, there were fifteen seamen admitted with yellow fever from nine other vessels arriving from infected ports, and upon which there was no sickness at the time of arrival at quarantine. Thus, the total number of seamen admitted from vessels presumed to be infected was one hundred and one, and these arrived on forty-four different vessels. Besides this number, six other seamen having yellow fever were received from the city who had contracted the malady from sources unknown. But as we shall have occasion to notice, in another place, those persons had been peculiarly exposed in certain localities about the city, where there is good reason to believe that the infection of yellow fever existed."

Previously to July 22, five cases of yellow fever had occurred on the beach $1\frac{1}{2}$ mile south of the hospital, and near Townsend's dock; and six cases, of which three died with black vomit, on the Long Island shore directly opposite the quarantine grounds, between the 13th and 21st of July. From the latter date the malady extended fearfully until it had visited nearly every dwelling on the shore of the beautiful Bay Ridge; thirty cases, and fifteen deaths having occurred in that district previously to August 1.

A chronological summary is presented in the report of all the cases of yellow fever that occurred, during the summer and autumn of 1856, in the port and vicinity of New York. In this are recorded five hundred and thirty-five cases, three cases being added that occurred among patients convalescent from other diseases in the Marine Hospital; it gives a total of five hundred and thirty-eight well-authenticated cases, as ascertained by the most rigid investigation. Of these, more than one-third died of black vomit. Of the twenty-nine cases recorded as occurring in Brooklyn, seven were persons resident in the eastern

district of that city, and twenty-two in the western district, or the City of Brooklyn proper. The origin of a large proportion of these cases, we are assured, was traced directly to infected places and infected goods.

The first case of yellow fever occurred among the garrison on Governor's Island, on July 29, and the malady continued to prevail quite steadily until the 10th of September. Though a very large number of cases occurred in that military command, the victims were selected exclusively from the south battery, which has a southerly and easterly exposure, facing, as it were, the quarantine ground, and all those portions of the bay shores which, with propriety, might be termed the great seat of infection. The officers of the command at Governor's Island assured the author of the report that no *material* cause of infection was conveyed to or existed upon the island.

"The first evidence of the presence of yellow fever in an endemic form in the vicinity of the Marine Hospital was presented July 22, when two cases of the malady occurred among the residents. All access to the grounds was immediately cut off, as far as the physician in charge considered he had legal authority to prevent access to the establishment, and the health of the employees was carefully guarded. The lodgings of the workmen were at once removed to the highest elevation on the western section of the grounds. But the presence of a large company of stevedores lodging in the government store every night, and uneasy of the restraint imposed by the health officer's bonds, made it necessary for the safety of the establishment, as well as the community beyond the walls, that many of our men should serve on the night patrol. This was a perilous service, in which several sickened.

"A very large amount of infected clothing from the sick, and bedding, etc., from infected vessels, were being constantly received and washed at the hospital wash-house, which must be regarded as furnishing a favourable nidus for the infection. Yet that building did not appear to be a source of general infection, as its upper rooms were nightly filled with the stevedores who were unlading vessels, and of whom none that lodged there suffered from the fever.

"From the fact that six persons who were employed at, or spent much time in the gate-keeper's lodge, sickened with the fever at an early date, and, from various other circumstances, we were led to conclude that the infected district within the inclosure probably extended in a narrow zone by the water side from the south to the north wall. West of that section the ground rises to a considerable elevation, and is terraced. None of the persons who remained permanently beyond the first terrace suffered from the fever until the cool autumnal nights appeared, when several very severe cases occurred in the wards and dormitories on the hill.

"Many of those who performed night service seemed to be so saturated with the poison of the malady that, when they yielded to its deadly power, they advanced very rapidly to the stage of black vomit. Indeed, from the outset of the endemic, the fever among the employees was observed to be of the most malignant character—black vomit and hemorrhages occurring in many cases as early as the thirty-sixth hour.

"The total number of officers and employees who suffered from the fever was twenty-five, of whom five died. Besides these, there were eight other cases of the malady among residents.

"Though the stevedores engaged in unlading infected cargoes began to suffer from the fever as early as July 10, the pestilence had not gained any foothold until July 17, when three cases occurred at the narrows, near Clifton Dock, Staten Island. All the cases are readily accounted for without requiring proof of any material fomites in or about the dwellings of those who became the victims of the fever. But it is known that considerable refuse material from vessels in quarantine was floated to the Staten Island beach by every flood tide. Such was particularly true of the section north of the quarantine walls, and at every ebbing tide refuse materials floated and lodged upon the beach near Clifton, where the fever first became endemic on Staten Island. Twenty-nine stevedores, resident on the island, contracted the fever, of whom all but one were brought into the hospital. In addition to these, five stevedores sick with the disease were admitted from the city.

"Three fatal cases of yellow fever occurred previous to July 20, on the Long Island beach, directly opposite to the Marine Hospital; and previous to July 27, fourteen cases had occurred, ten of which proved fatal."

"The first two cases occurred on Mr. Hunt's place, a little below Greenwood Cemetery, and about 300 paces off the beach. The two men were bathing in the bay, Saturday evening, July 11, and examined a quantity of straw which had been left on the beach by the receding tide, and requested their employer, Mr. Bergen, to allow them to remove the straw to the farm yard. The following Monday, one of these men was attacked with all the symptoms of yellow fever, and the other man was attacked on the succeeding day. Both died with black vomit. These men occupied a dormitory in an out-house, and, after they had died, two other labourers were hired, lodged in the same room, and successively sickened and died with black vomit."

"Mr. M. Bergen was quite ill. He allowed nothing brought from the shore to his dwelling, and was on board no vessel; but his residence was very near to, if not situated in the midst of a highly infected district."

On the beach, at the foot of 46th St., lived a Frenchman, a *chiffonnier*, who had been very busy gathering and drying refuse clothing, etc., which he picked up along the shore. He sickened July 25, and died on the twenty-eighth. Dr. Harris thinks it probable that in this manner the district in that vicinity became infected.

July 26, Chandler White, Esq., was attacked with the fever, and died of black vomit on the 8th of August. On the 28th of July, five cases of fever occurred in four families near the Bay Ridge dock, north of Mr. White's, and of these, three soon died with black vomit.

"August 1, the pestilence set its fatal seal on the Fort Hamilton district, a mile south of Mr. White's residence, and near to the fort. On that day died General Stanton, of the U. S. Army, and as his mansion was situated on an elevation which looked out directly upon Gravesend Bay, and was surrounded on the north and west by a dense grove, it was presumed that the deadly infection had been wafted to his delightful residence by southerly winds which swept over the infected shipping at Gravesend. Previously to General Stanton's death, a large number of vessels had discharged cargo at that anchorage for infected shipping."

"On the day of General Stanton's death two soldiers in the Redout were attacked with the fever, and up to August 8th, twelve cases had occurred in the fort. The history of these cases was such as to convince the intelligent and distinguished physician of the garrison at Fort Hamilton, that the infection had reached that stronghold by atmospheric agency only."

"Thirty-two cases of yellow fever occurred among the command at Fort Hamilton, besides the case of its distinguished physician, Dr. J. H. Bailey, whose unwearied labours for the relief of the pestilence-stricken population beyond, as well as those within the fort, were terminated by a severe attack, from which he finally recovered.

"It will be observed that we have noted three distinct and nearly equidistant points at which yellow fever made its appearance on the Long Island shore, between Gravesend Bay and Gowanus, a distance of nearly four miles. Subsequently, viz., about the 10th of September, the fever made its appearance in one house near Patridge's mill, near Coney Island. But those who became its victims are believed to have handled materials that floated on shore from the vessels. As regards the nature and mode of the infection received at the first-named three points, there can be no doubt that at the two most southerly, the cause and mode of access were *atmospheric*, while at the first, near Gowanus, it may have been by *material fomites*."

"Fifty cases of yellow fever were admitted to the Marine Hospital from the city of New York. Eight of these cases were traceable directly to Brooklyn, and the origin of nearly all the others was traced directly to vessels which were believed to be infected. The only exceptions, besides those which we have previously mentioned, were: 1. Several seamen and one Italian organ-grinder, from Water Street. 2. Six persons from the immediate vicinity of pier No. 11, and Albany St., North River. 3. Two cases from the water side

near the foot of 31st and 28th Streets, North River. All these were strongly marked and unmistakable cases of yellow fever, several of them terminating in black vomit, and there can be no doubt that in all of them the infection was received at certain well known localities by the river side.

"Most of the cases of yellow fever which remained and were treated in the city were traced to the infected shipping at quarantine. The cases admitted into the hospital and traced to Brooklyn furnished no proof that any other section of that city was infected than that which is situated between the Atlantic Dock and the South Ferry. There were three cases, however, the history of which afforded evidence that, by some means, the infection of the fever had reached some section near the Wallabout. But the etiology of these, like that of the cases received from the vicinity of 31st Street, North River, will, perhaps, remain buried in obscurity. They occurred late in the season, and may have originated from sources that did not expose others to danger."

"September 4, four persons, the remaining members of a family in the 15th ward, New York, were admitted to the Marine Hospital, two of them being strongly marked cases of yellow fever. The mother and son had died just previously; the son's illness being yellow fever with black vomit. This family had, for the purpose of sea-bathing, been residing for two or three weeks at Craven Point, Bergen, N. J. The house they occupied was so situated that at the highest tides it was nearly surrounded by water, and frequently there was much refuse material, &c., left on the beach by the receding tide. The owner of the dwelling suddenly sickened, and, after but a few days' illness, died. His widow subsequently became ill with like symptoms, but recovered. During the brief interim between these events, the family from New York returned to their residence in the city, where, in the course of four days, the first case of yellow fever occurred in the circle that had recently left their pleasant residence by the seaside.

"July 23, a man from Bergen Shore, N. J., was admitted to the New York City Hospital with yellow fever. He was a farm servant, and had not been absent from the farm for a long period. He died July 24th."

Other cases occurred in Jersey City, and at other points upon the shore of New Jersey, of which no accurate accounts have been obtained.

Dr. Harris refers next to what he considers the tidal agencies connected with the production and spread of yellow fever during the period of which he treats, and the meteorological phenomena of the season.

"The flood-tide," he remarks, "has great force in passing the Narrows, and in the vicinity of Staten Island shore near Quarantine. Floating materials are conveyed with great facility and certainty towards Craven Point and Jersey City, as well as up both the North and the East Rivers. The receding or ebbing tide returns such of those floating materials as do not find lodgment about the shores just mentioned, back towards the Narrows, or down the Kill Van Kull towards Newark Bay, the greater force being in the direction of Yellow Hook, and Fort Hamilton, and Clifton. The entire beach of Yellow Hook is the grand lodging-place for the refuse floating materials that are borne on the receding tides of the upper bay. In that locality the pestilence first made its appearance, prevailed longest, and was most malignant.

"There can be no doubt that the most active cause of the pestilence which more than decimated the entire population of the water side in the last-mentioned locality was from the accumulation of infected materials floated from the vessels in quarantine. We have already noticed the extension of the fever to New Jersey shore by the same agency, and it is rational to presume that the cases of fever which were admitted from the upper districts of New York and Brooklyn received the infection from a similar cause.

"The agency of the tides, therefore, must be regarded as one of the most important and active in diffusing yellow fever from the present quarantine anchorage, especially as the distance to, and the location of the favourable points for retaining floating materials is such, as to give the greatest facilities for a ready deposit of such *fomites*."

The meteorological register given in the report was kept, as directed by Government, at Fort Hamilton, by Dr. J. H. Bailey, U. S. Army.

"I will only refer in this place," says Dr. H., "to one striking fact noted in the register. Between the 21st and the 30th of July the wind was continually from the southwest during the afternoon of each day, while the temperature ranged unusually high (from 80.66, to 69.66, daily mean-average 76.3), and was accompanied with a corresponding degree of humidity of the atmosphere.

"It will be recollected, that on the 29th of July, yellow fever was announced as endemic at the fort and its vicinity; and at the same time it was raging most fearfully at quarantine. The same date also marks the commencement of the endemic on Governor's Island."

From a careful examination of all the facts contained in the report of Dr. Harris, of which we have thus given a very brief outline; which facts appear to us to have been collected with much care, and faithfully recorded, we think that some important conclusions may be deduced.

First, the danger of engendering malignant disease, by detaining a large number of infected vessels upon the same anchorage ground, and in close proximity to each other; especially during a season when the temperature and hygrometric condition of the atmosphere are such as are adapted to promote the development of disease.

Second, that the infectious air productive of yellow fever may be carried by the wind to some distance from the locality at which it is generated, so as to produce the disease in places where we have no reason to suppose that it would otherwise have occurred.

Third, that the danger of the production of disease by an aerial poison conveyed by currents of air from infected ships or localities will be always in direct proportion to the extent to which the healthy condition of the atmosphere of places lying in the course of such currents is already impaired by local causes, and the proximity of the places to the source of infection.

Fourth, that none of the facts contained in the report before us, prove positively that filthy clothing, bedding, etc., from on board of infected vessels, or the damaged and refuse materials and garbage cast into the water from such vessels, and conveyed by the tide and left by it upon the neighbouring shores, act as material fomites of yellow fever, in the correct sense of the term; or that contact with them alone is capable of communicating the disease. There can be no doubt, however, that the accumulation of any or all of the articles and materials referred to, beneath a hot sun, and amid a humid and stagnant atmosphere will be liable to produce a condition of things well adapted to favour the outbreak of yellow fever, increase the number of its subjects, and augment its malignancy, when all the other elements for its production are present, whatever these elements may be; whether they consist of some unknown endemic or epidemic influence, or the infected air from the holds of vessels recently arrived from a yellow fever locality.

Fifth, there is not a single fact reported by Dr. H. that countenances, in the slightest degree, the supposition of the spread of yellow fever by personal contagion; on the contrary, the entire history of the disease as presented to us in his report, would seem to be directly adverse to such supposition.

D. F. C.

ART. XXII.—*Report on the Origin of the Yellow Fever in Norfolk during the Summer of 1855, made to the City Councils by a Committee of Physicians.* 8vo. pp. 44. Richmond, Va., 1857.

THE report of the committee appointed by the Councils of Norfolk, Va., to investigate the cause and origin of the yellow fever which prevailed in that city during the summer of 1855, presents a very full and apparently careful history of the epidemic, from the occurrence of the first case until the disease had spread over nearly every portion of the place.

The report commences with a sketch of the position and topography of Nor-